PLANETARY PHENOMENA FOR MAY AND JUNE, 1921

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PHASES OF THE MOON, PACIFIC TIME

New Moon	May	7,	$1^h\ 1^m$	P.M.	New Moon	June	5, 10^h15^m P.M.
First Quarter	"	14,	7 25	A.M.	First Quarter	"	12, 1 0 P.M.
Full Moon	"	21,	12 15	P.M.	Full Moon	"	20, 1 41 A.M.
Last Quarter	"	29,	1 45	P.M.	Last Quarter	"	28, 5 17 A.M.

Summer begins June 21st, 3^h36^m P. M. the Sun reaching the summer solstice and beginning its southward march toward the equator.

Mercury comes to superior conjunction with the Sun on May 10th, becoming a morning star. The distance between Sun and planet then increases until greatest east elongation, 24° 13′, is reached on June 10th. Their distance apart then diminishes until by the end of the month the planet is nearly at inferior conjunction. The conditions for visibility of the planet in the evening twilight are the most favorable for the year. The greatest elongation on June 10th is larger than the average as the planet is not far from its perihelion and is also a little north of the Sun. Toward the end of May the planet has reached a distance from the Sun allowing it to be seen as an evening star. On June 1st it remains above the horizon an hour and three quarters after sunset, and does not get below an hour and one half until after the middle of the month. After this time the Sun rapidly approaches the planet so that their distance apart at the end of June is only about 8°. Therefore from the last week in May to the last week in June *Mercury* can be seen in the evening twilight, and for over half of this time it will be an easy object. On the evening of May 19th *Mercury* is in conjunction with *Mars* passing 1° 4′ north of the latter. The planets on this date are both too near the Sun for naked eye observation.

Venus passed inferior conjunction with the Sun on April 22nd and became a morning star. Its distance from the Sun increases so that by May 1st it rises nearly an hour before sunrise. On account of its great brightness it can probably be seen in the morning twilight. On June 1st it rises more than two hours before sunrise and at the end of the month the interval is more than two and one half hours. *Venus* is then practically at its greatest west elongation. The planet is considerably south of the Sun at that time and will be increasingly so until the late autumn. This causes the interval between the rising of the planet and sunrise to

be less than normal. The conditions are the reverse of what they were at the time of greatest east elongation in February, when *Venus* was far to the north of the Sun and remained above the horizon nearly four hours after sunset, altho the difference between the greatest elongations is only about one degree. *Venus* again is at its greatest brilliancy at the end of May, thirty-six days after inferior conjunction, and can be seen in full daylight for a week or more before and after this date.

Mars is still an evening star until June 28th, when it comes to conjunction with the Sun and becomes a morning star. On May 1st it sets rather more than an hour after sunset, and altho rather faint can probably be seen for a few evenings; but its apparent distance from the Sun diminishes steadily, and soon becomes too small to permit naked eye view. At the time of conjunction its actual distance from the Earth in miles is 242 millions and its brightness is about equal to that of the pole star. But as it is on its way to aphelion its distance from the Sun is increasing, and this causes its distance from the Earth to increase until July 18th, about three weeks after conjunction. Aphelion will not be reached until November.

Jupiter is in fine position for evening observation in the south and southwestern part of the sky. On May 1st it is on the meridian shortly after 8 P. M. and does not set until after 2 A. M. By the end of June it is on the meridian long before sunset and sets a little before 11 P. M. It ceases its western motion on May 6th and begins its eastward motion, very slowly at first but by the end of June it will have moved about 4° in the constellation *Leo* away from the brightest star in the constellation, *Regulus*, being at the end of June about 14° from the star toward the east.

Saturn is near *Jupiter* and gradually drawing nearer to it. It continues its retrograde or western motion among the stars until May 21st and then begins direct or eastward motion. By the end of June it will be about 6° east and 1° south of *Jupiter*. The rings are still practically out of sight. The plane of the rings crossed the Sun on April 10th and the Earth and Sun will be on opposite faces of the ring until August 3rd. So we shall be looking on the dark face of the rings until then.

Uranus rises about half after two A. M. on May 1st, and a little before 11 P. M. on June 30th. It is in the constellation *Aquarius* and moves slowly eastward and northward, the whole distance

being less than one degree. No bright star is near, but during June the planet is less than 1° south and west of the fourth magnitude star λ *Aquarii.*

Neptune is in the western sky in the evening in the constellation *Cancer.*